

We claim:

1. A stepped optical fiber from multicomponent glass, said stepped optical fiber having a numerical aperture ≥ 0.50 and comprising a core glass member and a cladding glass member, said cladding glass member completely surrounding said core glass member, wherein said core glass member has a core glass composition, which comprises

SiO ₂	42 to 53 % by weight,
ZnO	16 to 38 % by weight,
PbO	1 to 20 % by weight,
Na ₂ O	< 14 % by weight,
K ₂ O	< 12 % by weight,

wherein a sum total of ZnO and PbO ≥ 30 % by weight and a sum total of Na₂O and K₂O is ≥ 2 % by weight; and wherein said cladding glass member has a cladding glass composition, which comprises

SiO ₂	60 to 72 % by weight,
B ₂ O ₃	< 20 % by weight,
Al ₂ O ₃	< 10 % by weight,
Na ₂ O	< 18 % by weight,
K ₂ O	< 15 % by weight.

2. The stepped optical fiber as defined in claim 1, wherein said core glass composition and/or said cladding glass composition includes at least one refining agent in a standard amount for refining.

3. The stepped optical fiber as defined in claim 1, wherein said core glass member contains from 2 to 12 percent by weight of said PbO.

4. The stepped optical fiber as defined in claim 1, wherein said core glass member contains < 0.9 percent by weight of BaO.

5. A stepped optical fiber from multicomponent glass, said stepped optical fiber having a numerical aperture ≥ 0.48 and comprising a core glass member and a cladding glass member, said cladding glass member completely surrounding said core glass member, wherein said core glass member has a core glass composition, which comprises

SiO ₂	42 to 53 % by weight,
ZnO	30 to 38 % by weight,
Na ₂ O	< 14 % by weight,
K ₂ O	< 12 % by weight,
BaO	< 0.9 % by weight.

wherein a sum total of Na₂O and K₂O is ≥ 2 % by weight; and wherein the

cladding glass member has a cladding glass composition, which comprises

SiO ₂	60 to 72 % by weight,
B ₂ O ₃	< 20 % by weight,
Al ₂ O ₃	< 10 % by weight,
Na ₂ O	< 18 % by weight,
K ₂ O	< 15 % by weight.

6. The stepped optical fiber as defined in claim 5, wherein said cladding glass composition includes at least one refining agent in a standard amount for refining.

7. The stepped optical fiber as defined in claim 5, wherein said core glass member contains less than one percent by weight of PbO.

8. The stepped optical fiber as defined in claim 5, wherein said core glass member contains < 2 percent by weight of fluorine.

9. The stepped optical fiber as defined in claim 5, wherein said core glass member contains < 0.5 percent by weight of fluorine.

10. The stepped optical fiber as defined in claim 5, wherein said core glass member contains less than three percent by weight Li_2O .

11. The stepped optical fiber as defined in claim 10, wherein a sum total of said Li_2O + said Na_2O + said K_2O is greater than or equal to 2 percent by weight.

12. The stepped optical fiber as defined in claim 11, wherein said sum total of said Li_2O + said Na_2O + said K_2O is greater than or equal to 5 percent by weight.

13. The stepped optical fiber as defined in claim 5, wherein said core glass member contains ZrO_2 and said ZrO_2 is present in an amount of less than two percent by weight.

14. The stepped optical fiber as defined in claim 5, wherein said core glass member contains MgO and said MgO is present in an amount of less than six percent by weight.

15. The stepped optical fiber as defined in claim 5, wherein said core glass member contains CaO and said CaO is present in an amount of less than five percent by weight.

16. The stepped optical fiber as defined in claim 5, wherein said core glass member contains SrO and said SrO is present in an amount of less than six percent by weight.

17. The stepped optical fiber as defined in claim 5, wherein said core glass member contains B_2O_3 and said B_2O_3 is present in an amount of less than one percent by weight.

18. The stepped optical fiber as defined in claim 5, wherein said core glass member contains Al_2O_3 and said Al_2O_3 is present in an amount of less than 1.5 percent by weight.

19. The stepped optical fiber as defined in claim 1, wherein said cladding glass member contains Li_2O and said Li_2O is present in an amount of less than two percent by weight.

20. The stepped optical fiber as defined in claim 1, wherein said cladding glass member contains MgO and said MgO is present in an amount of less than three percent by weight.

21. The stepped optical fiber as defined in claim 1, wherein said cladding glass member contains BaO and said BaO is present in an amount of less than three percent by weight.

22. The stepped optical fiber as defined in claim 1, wherein said cladding glass member contains SrO and said SrO is present in an amount of less than four percent by weight.

23. The stepped optical fiber as defined in claim 1, wherein said cladding glass member contains CaO and said CaO is present in an amount of less than six percent by weight.

24. The stepped optical fiber as defined in claim 1, wherein said cladding glass member contains ZnO and said ZnO is present in an amount of less than three percent by weight.

25. The stepped optical fiber as defined in claim 1, wherein said cladding glass member contains F and said F present in an amount of less than one percent by weight.

26. The stepped optical fiber as defined in claim 1, wherein said cladding glass member contains Li_2O and wherein a sum total of said Li_2O , Na_2O and K_2O is ≥ 3 % by weight

27. The stepped optical fiber as defined in claim 1, wherein said cladding glass member contains from 66 to 72 percent by weight of said SiO_2 .

28. A method of transmitting light, said method comprising passing said light through said stepped optical fiber according to claim 1.

29. A light guide comprising a bundle of said stepped optical fibers according to claim 1.

30. A method of data transmission, said method comprising transmitting an optical signal encoded with data through said stepped optical fiber according to claim 1.

31. A motor vehicle including a stepped optical fiber according to claim 1.

32. The motor vehicle as defined in claim 31, wherein said stepped optical fiber transmits light for vehicle lighting.

33. A vehicle traffic signal device comprising a stepped optical fiber according to claim 1.

34. A railroad signal device comprising a stepped optical fiber according to claim 1.

35. An alphanumeric display comprising a stepped optical fiber according to claim 1.

36. A cold light source comprising a stepped optical fiber according to claim 1.

37. An endoscope for medical and engineering purposes, said endoscope comprising a stepped optical fiber according to claim 1.

38. A method of illuminating an operation microscope, said method comprising using said stepped optical fiber according to claim 1.